A

PROBATIONARY ESSAY

ON THE

MEDICAL JURISPRUDENCE OF

BLOWS AND CONTUSIONS;

SUBMITTED

BY AUTHORITY OF THE PRESIDENT AND HIS COUNCIL,

TO

THE EXAMINATION

OF THE

Royal College of Surgeons of Edinburgh,

WHEN CANDIDATE

FOR ADMISSION INTO THEIR BODY,

IN CONFORMITY TO THEIR REGULATIONS RESPECTING THE ADMISSION OF ORDINARY FELLOWS.

BY

DAVID SKAE, SURGEON,

MEMBER OF THE ROYAL MEDICAL SOCIETY.

OCTOBER 1836.

EDINBURGH:

PRINTED BY BALFOUR AND JACK.

MDCCCXXXVI.

TO

WILLIAM LAW, Esq.

F.R.C.S.E.

THIS ESSAY

IS RESPECTFULLY INSCRIBED,

IN REMEMBRANCE OF PAST KINDNESS,

BY HIS FORMER PUPIL,

THE AUTHOR.

TO

DAVID DAVIDSON, Esq.

SURGEON,

THE FOLLOWING ESSAY

IS DEDICATED,

AS A TRIBUTE OF RESPECT,

AND IN TESTIMONY OF THE AFFECTIONATE REGARD OF

THE AUTHOR.

OF

THE MEDICAL JURISPRUDENCE

OF

BLOWS AND CONTUSIONS.

The importance of any object is very nearly estimated by the number of its relations, and, in proportion to that number, is, in general, our familiarity with the object, and the accuracy of our knowledge regarding it. Thus, iron, a metal of little exchangeable value, in consequence of its numerous relations as a mechanical and chemical agent, becomes an object of the highest interest and importance. Thus also, do the details of anatomical structure, in themselves dry and tedious, become interesting in the extreme, when considered with an immediate reference to their physiological and practical relations. It is by the number and importance of these relations that we estimate the value of every fact; and it is by these that they are associated together, and remembered when the knowledge of them is required. The anatomical fact, and the physiological or practical relation become, as they ought to be, inseparably connected together, and mutually suggest each other. In this way, anatomy must be taught and studied, in order to be remembered; and in this manner its facts are remembered, according to the importance of each. If we would impress any fact, then, upon our minds, which it may be useful or necessary at any time to know, we must make ourselves acquainted with all its relations. It is thus that

the study of disease with reference to the highly important objects of justice, while it increases our value as members of society, by enabling us at times to clear the innocent, or detect the guilty, increases also our value as surgeons and physicians, by rendering more accurate, and more readily remembered, our knowledge of the diagnostic marks of disease. Such reflections as these are naturally suggested by the subject of the following paper.

In Medical Jurisprudence, the term *contused wound*, comprehends all injuries inflicted by external violence without breach of surface.

The questions which may arise in a judicial investigation of such cases, are of the highest importance. Such, for instance, are the following; with what instrument was the injury inflicted? how far was it injurious? whether was it inflicted before or after death? whether was it accidental, malicious, or suicidal? and, how far was it influenced in its result by collateral circumstances? All these inquiries may, in some measure, be determined, in many instances, by an accurate inspection of the injury; and they all bear an immediate and important relation to the guilt or innocence of the accused. Thus, although it be equally murder, "whether the fatal violence be committed by blows with a hatchet on the head," or by blows on the ear with the fist, the *malice prepense* being inferred from the intentional act of killing, yet a defence may be founded by the pannel on the nature of the weapon used; and, if it can be shown that it was so plainly inadequate, in general circumstances, to cause death, he may be acquitted, or the punishment restricted, on the ground that there was no intention to kill, or to inflict such a grievous bodily injury as to endanger life. So, on the other hand, the use of a ponderous or lethal weapon, will form a strong presumption of the deliberate intention to inflict mortal injury. Again, the situation of the wound, or the character of it, may have a material influence in determining whether or not it was suicidal or malicious,—whether

it was inflicted before death by a murderer, or after death by accident, or from a design to implicate an innocent person. So also, the case may be modified by malformation or disease in the sufferer, or by the relations of the organ injured. Thus, a slight blow on the stomach may cause instant death; a blow with the elbow may kill a man with an aneurism, as a switch with a cane has caused death in a boy with a preternatural thinness of the skull.

Contusions are injuries inflicted with a blunt instrument, by which the tissues are bruised or broken, and the vessels ruptured. The danger from such wounds, arises principally from the rupture of important organs. The term *contusion*, in works on Medical Jurisprudence, has hitherto been used to comprehend all such injuries, where there was no breach of surface. There seems, however, to be an important distinction overlooked, in this generalization—a distinction relating to the rapidity of the blow, and to the weight of the instrument with which the injury has been produced; and as this distinction relates also to the effects produced on the body, and can be to a certain extent determined by an examination of the morbid appearances presented, and the quantity of violence, and the nature of the instrument, therefore, so far predicated from these appearances—it becomes a matter of the highest consequence in reference to medico-legal investigations. The distinction to which I allude, is founded upon the following principles. There is a class of injuries, where the vessels of the skin and superficial parts are chiefly ruptured; and there is another class which are followed by the rupture of deep-seated organ and vessels, and by fracture of the bones, with, frequently, no external marks of violence. Now, the difference in the result must depend upon a difference in the cause which preceded it; and a knowledge of the principle by which this difference is regulated, will enable us from the cause to foretel the result, or, from the result to infer the cause.

It appears, then, that the first kind of injury, namely, that

where the superficial parts are mostly ruptured, and ecchymosis, external swelling, or fracture of *superficial* bones, produced, is effected chiefly by blows with a comparatively *light* instrument projected with considerable *velocity*, by what may be called, a "*quick light blow*," or what is usually denominated, a "*smart blow.*" Injuries of the second class, on the other hand, those, viz. where deep parts are mostly injured, and deep-seated fractures, ruptures, or extravasations produced, are effected, generally, by *heavy masses* projected with less velocity, or by bodies acting merely by their own weight, by what may be called a "*slow heavy blow*," or by what is usually and more strictly denominated a "*bruise.*" The first kind of injury may, with considerable advantage practically, and for the convenience of a general consideration of the subject, be understood as the definition of a *blow*, strictly so called; while the term *contusion* will serve generally, but more precisely than is usually done in works on forensic medicine, to denominate the second kind of injury. And, indeed, it seems, although this distinction has not been recognized in systematic works, that this is the strict meaning which we tacitly attach to these terms in their ordinary application; and it is in this signification accordingly, as one of some practical value, that they shall be used in the following paper.

The distinction may be farther illustrated by a reference to the arts, in which there will be found to be some analogy, and by particular or hypothetical cases of accidental or malicious injury.

Thus, an artist, if he wishes to expand the point of a rivet, uses a light hammer and a rapid blow; but, on the other hand, if he wishes to divide a bar of iron of considerable thickness, he uses a heavy instrument, and his blow is diminished proportionately in its velocity. The surface of a bar of metal is cut or "nicked" with light instruments preparatory to dividing it by a blow with a heavy one. Every one knows, that if a small hammer were used, the force would

immediately be exhausted, the surface only flattened, and the "nick" obliterated; whereas, if a blow is struck with a large and heavy instrument, the force is communicated through the whole bar, and it is immediately divided. In the same manner, the surfaces of stones are hewn, and the minute work of stone-carving is executed, by smart blows of a wooden mallet upon a small chisel; and, the finer the surface to be removed, the smaller and lighter are the chisel and mallet which are used; while large masses of stone, on the other hand, are divided or crushed by the tardier motion of a ponderous hammer. It is on this principle that we are to explain a common feat performed to excite the amazement of the vulgar. A man has a large anvil placed on his chest, and he allows another to give violent blows on it with a hammer, any one of which, if applied directly to the chest, would produce extensive fractures of the sternum or ribs, if they did not penetrate the cavity, or produce instant death by concussion. The explanation is as follows:—Suppose that the hammer moves with a final velocity of ten feet in a second, and that the anvil is forty times the weight of the hammer, it is plain that the velocity of the blow must be diminished forty times in being communicated through the anvil; the anvil will, consequently, move only with an incipient velocity of three inches per second; the ribs have thus time to yield and recover themselves, which, from their arched shape, they can readily do from a blow of this kind, and thus no injury is sustained. A smart blow with a switch, or even with a cord, over the thorax, will produce ecchymosis; a blow, if it is equally rapid, with a heavy weapon, will produce fracture of the ribs in addition; but a blow of less velocity, and of greater weight, while it will produce no ecchymosis at all, may yet fracture the bones. The blow with the switch is exhausted in overcoming the elasticity of the skin, and produces only superficial effects, while the pressure of the heavy blow is communicated through the whole chest.

In farther illustration of the same principle, it may be re-

marked, that the extensive ecchymosis, which can be produced by a blow of the fist, is familiar to every one ; such a blow is rapid, and the instrument comparatively light. So, also, ecchymosis, and effusion of blood into the superficial cellular membrane, so as to cause considerable external swelling, is readily and most frequently produced by blows of a stick. If the instrument be wielded with very great velocity, more particularly if it be somewhat ponderous, or of denser material in proportion to its bulk, and the bones be superficial, fracture may be produced. Such cases have occurred in fractures of the cranium, but they are comparatively rare from blows of this description, being much more frequently the result of injuries inflicted with a heavy instrument, or of falls from some height, or of gunshot wounds.

There is another result which seems to be in some measure peculiar to injuries from *blows*, as defined, and that is *concussion*. Death from *blows* on the head, is a more frequent effect of concussion than of fracture with depression or effusion. Thus in the case of Malcolm Brown, July 29, 1664, death appears to have been produced by concussion, in giving a boy "*a blow on the ear with a fist.*" So in the case of Anderson and Glen, 5th November 1823, "who were executed for the murder of a man on the road near Ayr, it was caused by blows on the head with *the fist* only, which produced *concussion* of the brain, and death in a few hours after."[2] Again, in the cases of Lieutenant Story, 24th January 1785,[3] and Durrand, 21st September 1830,[4] death appears to have been produced by concussion of the brain, from blows on the head with a bottle ; in the latter case it ensued immediately. In like manner in the case of Richard Hamilton, July 1807, the pannel killed an old woman by several blows on the head with his hand ;[5] and in the case of John M'Donald, Glasgow,

[1] Hume's Commentaries, vol. i. p. 262.
[2] Alison's Principles of the Criminal Law of Scotland, p. 4.
[3] Ibid. 93. [4] Ibid. 64. [5] Ibid. 95.

autumn 1806, immediate death was caused by a small stone thrown by the pannel, which struck the deceased on the temple;[1] in both cases, death must have been produced by concussion. Numerous cases of a similar nature might be given, but these seem sufficient, and have been selected out of many, because, from the manifest lightness of the instrument, the relation between the velocity of the blow and the effect produced is more apparent. A *contusion*, in the defined sense of the word, will not, I conceive, produce death by concussion, unless it combine considerable velocity with the weight of the instrument used.

Another effect produced by smart blows, or falls from a height, is concussion of the spinal cord. Such cases are by no means uncommon. Dr. Abercrombie mentions a case produced by a piece of stone projected against the lumbar vertebræ, in the blasting of a rock near Edinburgh.[2] He relates a similar case, the result of a fall from a tree,[3] and one from Hufeland, caused by a fall from the top of a cart; the immediate symptoms of concussion, in the two last cases, were followed, apparently, by a chronic inflammation of the cord or its membranes, as is common after similar injuries of the brain.

Analogous to this effect upon the great nervous centres, is the sudden death produced by a blow upon the epigastrium. The exact cause of this phenomenon has not been positively determined, but it seems, undoubtedly, to be analogous to concussion of the brain or spinal cord, and most probably consists in a similar change, propagated through the par vagum, and producing instantaneous suspension of the functions of life, either by suddenly stopping the respiration, or by palsying the heart's action. One instance is sufficient; "a case occurred in London, some years ago, where a man killed his

[1] Alison's Principles of the Criminal Law of Scotland, p. 99.
[2] On Diseases of the Brain and Spinal Cord, 1828, p. 376.
[3] Ibid.
[4] Journal, vol. xxi.

comrade, by giving him a pat on the pit of his stomach with his open hand."[1]

From these remarks, it may be permitted to draw the following general conclusion, that the effects of smart blows are ecchymosis and concussion, and that these effects are, *ceteris paribus*, proportioned to the *velocity* of the blow, while the danger of fracture is proportioned to the *weight* of the weapon.

The effects of *Contusions*, strictly so called, may be illustrated by a reference to falls, and gun-shot wounds. Fractures of the bones, and rupture of the viscera, or large vessels, have been stated to be the results of *contusions*, or *heavy blows*. Sir Astley Cooper states that fractures of the base of the cranium are produced by falls from a great height on the summit of the head.[2] Fractures of the skull, generally, with or without depression or effusion of blood, are commonly produced either by wounds with a half-spent ball, or blows with a *heavy* instrument, or, which is the most common case of any, by falls, in which case the weight of the blow is proportioned to the weight of the body, and its velocity to the distance from which it has fallen. In such cases, more especially when the fall has been from a height, the symptoms are compounded of those of concussion and compression. Effusion of blood betwixt the skull and dura-mater is also a common effect of such an injury; while smart *blows*, on the other hand, produce the most extensive effusions beneath the scalp. Contusions, however, it must be remarked, if there be any degree of velocity in the blow, as well as blows strictly so called, are more apt to produce ecchymosis, if the skin covers a superficial bone, as over the cranium and tibia, than when there is some depth of soft parts; but, in all cases, this ecchymosis is *ceteris paribus*, proportioned to the velocity of the blow, and not at all to the weight of the instrument. In the same manner, on the other hand, the softness and yielding nature of the parts

[1] Beck's Elements of Medical Jurisprudence, 1836, p. 637. Dunlop.

[2] Lectures on Surgery, &c. vol. i. p. 289.

may prevent ecchymosis appearing even from a smart blow; but when produced in such places, it is owing to the smartness of the blow, or to ruffling and grazing of the parts. The general principle then remains good, that external blackness is greatest from a quick slight blow, and internal rupture from a slow and forcible one. This is further strongly illustrated by the following quotations. "CHAUSSIER relates the case of a strong man, thirty years of age, who, while driving a cart heavily laden with stones, attempted to get on the back of one of the horses, and, falling in the endeavour, the wheel passed slowly over his left shoulder, crossing the clavicle near the sternum, and continuing its course obliquely over the entire left side of the thorax. The body was found the following morning on the road, lying on the back, with the track of the wheel marked on the clothes by a broad streak of mud. Nevertheless on stripping the body, there was no appearance on its exterior, that could lead to a knowledge of the cause of death. However, after removing the integuments and muscles of the thorax, it was found that the clavicle was torn from the sternum, and all the ribs of the left side were fractured, but there was no ecchymosis under the skin or round the fractures. These fractures were not complete, but were limited to the inner surface. On opening the thorax, the pericardium was found distended with coagulated blood, and a large rent was discovered in the left auricle of the heart."[1]

A very interesting case, strikingly illustrative of the principle which I have endeavoured to point out, occurred to Dr. JOHN GAIRDNER, and the preparation is preserved in the Museum of the Royal College of Surgeons.

The subject was a girl of 10 years of age, and her death was occasioned by the wheel of a loaded cart passing over her body. She died instantaneously.

"There was scarcely any perceptible trace of the impression of the wheel externally, and no subcutaneous extravasation, except a very slight one under the left nipple."

[1] Cyclopedia of Practical Medicine, 1836, vol. iv. p. 557.

"In the thorax, the only deviation from the healthy state was rupture of the heart, with extensive laceration of its substance. Both ventricles, and both auricles, were laid open by the laceration, and the septum torn to shreds. About one-half of the substance of the heart had burst a way for itself through the pericardium into the right cavity of the thorax, where it was found immersed in a very large quantity of grumous blood, and still attached to the other parts by means of a small portion near the apex, where the rent had stopped." Yet all this happened with little or no external marks, and without the slightest injury of a single rib.[1]

Again, "Dr. WAGNER, in his Annual Report for 1833, of the School of State Medicine in Prussia, relates the case of a child run over and killed, and in whom the spleen and kidney were crushed, while no external injury, except a very slight excoriation, was observable on the body. (London Medical Gazette, vol. xiii. p. 794. For further instances, see the same Journal, vol. xv., pp. 668, 727, 729.) In all these (four in number,) either the liver, spleen, lung, or intestines, were ruptured; yet the surface of the body presented little if any marks of injury."[2]

But perhaps the best illustration of this principle is in the injuries produced by cannon balls, which may kill by concussion, partaking in this respect of the nature of blows; or they may produce extensive fractures of the bones, rupture of the vessels, and may even reduce the viscera to a pulp without any external marks of injury, but this is apparently always proportioned to the degree to which they are spent. Thus, in two cases reported by Baron LARREY, "the skin was entire, though slightly ecchymosed; the muscles, aponeuroses, nerves, and vessels of the shoulders were ruptured and lacerated, the scapulæ broken in pieces, the spinal processes of the corresponding dorsal vertebræ, and the posterior extremity of

[1] Edin. Med. Chir. Transactions, vol. i. 662. This case was kindly pointed out to me by Dr. GAIRDNER.

[2] BECK. Op. Cit. 646.

the adjacent ribs fractured. The spinal marrow had suffered injury; the neighbouring part of the lungs was lacerated, and a considerable extravasation had taken place in each cavity of the chest."[1] "DUPUYTREN mentions the case of a soldier, struck with a cannon ball obliquely on the left flank, which produced no external wound, but an early death discovered dreadful injury to the kidney, the lumbar vertebræ and nerves, the lower ribs, and the parietes of the abdomen. The skin alone had resisted the disorganizing action of the shot."[2]

It is to be observed, however, that there are blows of a composite character, partaking of the velocity of blows, and of the weight or force of contusions. In these the effects produced are also of a composite character, presenting the superficial effusions and the concussions of *blows*, and the deep-seated ruptures, extravasations, and fractures of *contusions*. The instrument with which they are produced must be heavy, and projected with considerable velocity. Such, for example, are the effects produced by a cannon ball if it is not almost spent, as in the cases quoted from LARREY, where superficial ecchymosis existed. Such also are the cases of violent injury of the skull from blows with tongs, or heavy hammers, where the bones are fractured, and depressions or extensive effusions within the cranium produced. In all cases, whether simple blows, or contusions, or blows with contusion, the principle remains the same, that the superficial effects are proportioned to the *rapidity* of the blow, and the deep to the *weight* of the instrument.

It becomes a matter of the utmost importance, in many criminal cases, to ascertain, if possible, the instrument with which an injury has been inflicted. This is carefully attended to in the examination of incised or punctured wounds, the length, breadth, and depth of which are carefully measured for that purpose. If the principles which I have endeavoured

[1] COOPER's Surgical Dictionary, 1830, 6th edit. p. 578.

[2] BECK, from Medico-Chirurgical Review, XXV, 298.

to lay down, are correct, principles, which I conceive are tacitly recognised in practice, though not systematically expressed, a tolerable idea may be formed, from the examination of a contused wound, of the instrument and kind of force with which it was inflicted. Thus it could be inferred in a case of violent death, where nothing presented itself but a number of superficial ecchymoses, or effusions of blood between the scalp and cranium, that the blows were probably inflicted with a stick, or a similar instrument, and that the deceased died of concussion. If, however, fractures and deep-seated effusions within the cranium presented themselves, without much external appearance of injury, the instrument was probably large and ponderous, or the effects were produced by a fall. In the same manner, we would infer that death, with slight ecchymosis of the epigastrium, and no rupture or inflammation of the viscera, was probably caused by a blow on the pit of the stomach with the fist, or some instrument wielded in the hand ; but if rupture of the stomach or liver, &c. were found, without external marks, the injury was probably inflicted by a fall from a height, or from the pressure of a large body, as from being trod under foot, or run over by a waggon. Thus Fabricius mentions the case of a man " who was so dreadfully trodden under foot, that not only the stomach was burst, but there was a rupture of the diaphragm, and the foot passed into the cavity of the thorax, and, notwithstanding this, except some slight elevations of the epidermis, in the form of vesicles, the *integuments and abdominal muscles did not appear in the least injured.*"[1] So also in the case of the three soldiers, who fell over the rock in attempting to get out of Edinburgh Castle in 1824, the livers of all three were found lacerated. Two cases of rupture of the liver occurred from the wheel of a coach, another from a fall off a waggon ;[2] and in a number of cases referred to by Beck, of rupture of the spleen, they all occurred from falls, or *severe blows*, (under

[1] Beck, 637, from Mahon.

[2] Ibid. 640.

which term he includes contusions from waggon wheels), except one, taken from Rust's Magazine, where the blow was inflicted with a long elastic switch; but in that case, the deceased had been long afflicted with intermittent fever, and the liver and spleen "were so soft that a slight pressure sufficed to tear them," on which account the man was acquitted.[1] So in the case of Burke, December 1828,[2] the marks of ecchymosis on the legs and arms of the victim were most probably produced by kicks previous to, or during the mortal struggle; and the effusion of blood, which formed a tumour under the scalp, by the blow with which she was struck down to a sitting posture on the floor; while the deep-seated lacerations of the spinal ligaments, and effusions among the muscles, were, in all likelihood, produced by subsequent pressure. This is confirmed by the experiments made by Dr. Christison in consequence, which shewed that extensive effusions among the muscles of the back, and cellular tissue of the spinal canal, could be caused by force even after death.[3] So, when bodies were sent to London for dissection from distant parts of the country, tightly packed up in boxes, extensive extravasations of blood into the cellular membrane between the muscles of the back were uniformly present.[4]

Again, when the injury partakes of the character both of a blow and contusion, it may be inferred that it was inflicted with a ponderous instrument, wielded with some velocity, as in the cases given.

These principles are suggested with considerable diffidence, as liable to so many modifications from the state and character of the organ injured, and the insensible shades of difference by which the one kind of violence merges into or combines with the other. Still they may be of some importance in medico-legal investigations, in enabling us to determine

[1] Beck, 640, from Mahon.

[2] Trial of W. Burke and H. Macdougall. Buchanan, Edinburgh, 1828.

[3] Edinburgh Medical and Surgical Journal, xxxi. 246.

[4] Dr. Beatty, Cyclopedia of Pract. Med. iii. 535.

the instrument by which death was inflicted, especially if they are more carefully investigated, and if, in every case where the cause is accurately known, the character and extent of the injury is compared with the character of the instrument and the velocity of the blow.

Certain appearances found on the body, produced by natural causes, or by injuries inflicted after death, resemble in some degree the ecchymosis produced by blows on the living body. It becomes, therefore, a matter of the highest consequence, in questions respecting murder from wounds, to be able to distinguish between these.

Some experiments performed on the living body, with a view to ascertain how soon the greenish-yellow, which surrounds the livid mark, presents itself, enable me to give the following description of an ecchymosis, which will perhaps be deemed more accurate and minute than those yet given. I give one example, *instar omnium*.

A smart blow being struck over the inner side of the tibia with a stick, the skin immediately swelled over a surface of an inch and a half by one inch, and, in about one minute, a bluish-black discolouration was very apparent on the part struck by the prominent edge of the stick; a blush of inflammatory redness, which disappeared momentarily on pressure, extended over the whole surface swollen; the swelling appeared to be greatest in about *two hours*, at which time the superficial redness was perceptibly less, and a small point of *greenish-yellow* was observable under the lower margin of the blue mark; this greenish-yellow continued gradually increasing for about six hours, the swelling and redness simultaneously diminishing. The bluish-black mark appeared to be made up of a number of dark points surrounded by a diffused blueness. The circumference of the whole was irregular and undefined, and surrounded every-where by a margin of the greenish-yellow, varying from half an inch to an inch in breadth. The whole thus occupied a space of about three inches and a half by two inches; the blueness

became gradually less, and the greenness, after becoming, in the course of a day or two, of a darker and duskier hue, was then gradually absorbed. In most medical works, the changes of colour are stated to depend upon the gradual absorption of the effused blood; and it is stated generally, that, if the blow has been inflicted two or three days before death, this yellow margin may be observed.[1] In these experiments I was struck with the early appearance of the yellowness, and with the fact, that it appeared where the blueness had never extended, seeming to keep pace exactly with the disappearance of the inflammatory redness, and shewing that the yellowness was consequent upon a vital process, and could not have taken place after death.

The appearances presented by dissection of an ecchymosis caused during life, are described by Dr. Christison to consist in effusion of *coagulated* blood into the subjacent cellular tissue, distending and filling the cells, or forming a distinct clot, or fluid blood, if the blood has not coagulated at all, and "incorporation of blood with the whole thickness of the true skin, rendering it black instead of white, and increasing its firmness and resistance."[2]

There are two kinds of appearances from which this must be distinguished in post-mortem examinations; these are, the livor which appears naturally in most bodies a few hours after dissolution, and the discolourations which can be produced upon the body by violence after death. The first arises from natural causes, and may lead to suspicion of violence where none has been inflicted; the second may arise from accident, or may be produced by malice, in order to throw suspicion on an innocent party.

[1] "The blood, after being thus effused, is gradually removed by absorption, during which the colour of the part passes through various shades of red, green, and yellow."—Syme's Surgery, i. 173.—"The shades produced by the gradual absorption of the blood are familiar to all medical men."—Beck, 491.

[2] Edin. Med. and Surg. Journ. xxxi. 248.

Lividity, from natural causes, as far as I can ascertain, begins to appear on the body in from two to six hours after death ; but this seems to vary considerably with the state of the blood, and the previous disease or debility of the subject. It consists of spots of various degrees of dark redness, which increase in depth of colour, according to the length of time that has elapsed from the death of the subject.[1] They differ from ecchymosis in being defined in their circumference, and never surrounded with a yellow margin. With one exception, they occur only in the dependent parts of the body, or in those which have been dependent, and appear to arise from the gravitation of the blood, as they may even be made to disappear altogether if the position of the body is altered before the coagulation of the blood.[2] The body being generally laid on the back, they are found chiefly on the posterior region of the head and neck, extending over the greater part of the back, particularly in the hollows, but prevented from accumulating in the prominent parts by pressure of the body, especially if it has lain on a hard and flat surface. The *face,* however, and scalp generally, is often livid even when there is no lividity found in any other part of the body. This is particularly the case in death from sanguineous apoplexy and hanging ; but in such cases the redness is general, and without any defined margin. In lividity from gravitation, " it is moreover to be observed, that the redness is vascular, and that the surface of the skin presents the appearance of a ramiform distribution of vessels."[3] The fluid blood upon which it depends is contained within the vessels of the true skin. The redness, on the other hand, caused by blows before death is diffused and uniform, without any appearance of vessels.

The course of the large veins, whether superficial or otherwise, becomes indicated, as putrescency advances, by streaks of a livid colour. In the advanced stage of putrefaction, when

[1] Dr. R. B. Todd. Cyc. of Pract. Med. iii. 534.
[2] Dr. Beatty. Ibid. 321.
[3] Todd, op. cit. 534.

the blood is again fluid, the cellular tissue becomes anasarcous from the escape of serum, which is now tinged with the red colour, and livid appearances from this cause are presented in various parts of the body, where the tissue is lax and distensible, as in the occiput, loins, eyelids and scrotum.[1]

The second kind of appearance to be distinguished from ecchymosis, is that caused by violence inflicted soon after death. The most accurate observations on this subject are those made by Dr. Christison, with reference to the trial of Burke in December 1828, and detailed in the Edinburgh Medical and Surgical Journal,[2] the following abstract of which will contain the most important conclusions on the subject.

As to the time within which these post-mortem appearances can be produced, Dr. Christison remarks, "it is impossible to fix absolutely the limit of the interval, beyond which contusions cannot be imitated by violence applied to the body. It appears to vary with the state of the blood, and the time which elapses before the body cools, and the joints stiffen. Sometimes the appearance of contusions can hardly be produced two hours after death, sometimes they may be slightly caused three hours and a quarter after it; but I should be inclined to think this period very near the extreme limit. Wherever the warmth of the body and laxity of the muscles were not considerable at the time the injury was inflicted, we may be sure that the appearance of contusions cannot be considerable. It is probably, therefore, only on the trunk, that, even in the most favourable state of the body, namely, when the blood remains altogether fluid, any material mark of contusion can be produced so late as two hours after death."

In the experiments made by Dr. Christison, it appears, that in those cases where blows were struck about an hour and three quarters, and two hours after death, discoloration almost immediately ensued, the colour corresponding with the prominent part of the stick or mallet. Of these marks, some,

[1] Todd, op. cit. 534.

[2] Vol. xxxi. pp. 236–250.

inflicted on the trunk, were dark bluish black stripes, as deep in tint as any contusions inflicted during life, but without swelling. Others, produced by blows on the extremities, were shewn by faint stripes, consisting of bluish black points. From blows struck about three hours and a quarter after death, the discolorations did not immediately ensue, but were quite distinct when examined fourteen hours after, consisting each of two long narrow lines of dark lividity, with an intervening colourless stripe, corresponding with the prominent part of the stick. The marks of blows inflicted at a later period consisted, particularly if the cutiele was comminuted, of dryness and brownness of the surface, but in no case was there any discoloration of the skin, or effusion, as in the other cases.

In the examination of these marks, it was found, that the discoloration was chiefly under the cutis, consisting of an effusion of the thinnest possible layer of the fluid part of the blood; in some instances this effusion occupied a perceptible stratum of the true skin itself, and in those cases where the blows were inflicted at an early period, there was an effusion of dark fluid blood into the subcutaneous cellular tissue in the seat of the discolorations, so as to blacken or redden the membranous partitions of the adipose cells, but this effusion was never extensive.

Ecchymosis, then, the effect of an injury inflicted on the body during life, may be distinguished from livor, the result of natural causes, and from the effects of violence after death, by the following distinctions:—Ecchymosis may be found in any situation; livor occurs only in dependent parts, except in those cases, easily distinguished, where it covers the face or extends over the whole scalp, as in death from hanging and apoplexy. In ecchymosis there is generally swelling, either from inflammation, or from the extent of the effusion. This can never be produced in the dead body, either by natural causes or by violence. When the violence has been inflicted some hours before death, there will most probably

be found a greenish yellow margin surrounding the black mark; this appearance can only be formed during life. In livor, the margins are well defined, in ecchymosis they are irregular and diffused. In livor the blood occupies the vessels, and in marks of blows inflicted after death, it colours the outer surface of the true skin, and may even occupy a thin stratum of it, and may be injected into the membranous partitions of the adipose cells; but in ecchymosis, the blood is found above and within the true skin equally, and may be extensively effused into the superficial cellular tissue, filling and distending the cells, which could hardly be produced in the dead body, unless in the vicinity of a large vein. "Perhaps one of the most characteristic signs," says Dr. Christison, "of a contusion inflicted during life, is incorporation of blood with the whole thickness of the true skin, rendering it black instead of white, and increasing its firmness and resistance. This sign may not always be present, for, as every one knows, a blow may cause extensive extravasation below the skin, without affecting the skin itself. But when present, I am disposed to consider it characteristic, because I have never been able to produce it in the dead body, and it is not easy to conceive, how such a change can be wrought without the force and agency of living vessels."[1] Lastly, in effusion from a blow inflicted during life, the blood is generally *coagulated*, and the clots may be of such a size as to cause considerable swelling; although the blood could not flow from the vessels after death, with sufficient force to cause swelling, yet it is possible that a considerable clot might be formed if a large vessel were lacerated "in the neighbourhood of loose cellular tissue,"[2] and if the blow were inflicted before the coagulation of the blood. In general, however, in effusion from violence after death, and in lividity, the blood is found fluid. "In the instances in which the blood does not coagulate at all after death, contusions caused during life may

[1] Christison, op. cit. 248. [2] Ibid.

be recognized by the extent of the effusion into the cellular tissue."[1]

Induration of the cellular tissue immediately beneath the skin, seems occasionally to be an effect of external pressure before death, as occurred in the case of a female who hung herself at the Salpétrière. There was no ecchymosis, but the mark of the rope was indicated by a light brown tinge, and, on dissection, the cellular tissue beneath was found dry and compressed, so as to form a brilliant white band a line and a half in breadth. The pressure had not been long continued, as she was seen to hang herself and was cut down immediately.[2] Induration of the cellular tissue forms no part of the pseudo morbid appearances found on dissection, although emphysema is a common occurrence, particularly as decomposition advances, or is accelerated by the state of the body immediately preceding dissolution.

We now come to the consideration of blows and contusions of particular parts.

The most common effect of a light but smart blow on the *head* is the effusion of blood between the cranium and the epicranial aponeurosis. "When the scalp receives a very *smart* blow," says Mr. Pott, "it often happens that a quantity of extravasated blood immediately forms a tumour, easily distinguishable from all others, and generally very easily cured." These extravasations are sometimes very extensive, as in a case related by Brodie, where the effusion extended from the superciliary ridges to the nape of the neck, and from ear to ear.[3]

If the blow be heavier, inflammation and suppuration may be produced, or compression of the brain from effusion of blood, or depression of a part of the skull. Of the first effect, it is remarked by Mr. Pott, that "smart and severe blows on the middle part of the bones, at a distance from the sutures, are most frequently followed by this kind of mischief:

[1] Christison, op. cit. 248. [2] Op. cit. supra, xix. 487.
[3] Cooper's Surgical Dictionary from Medico-Chir. Transactions.

the coats of the small vessels which sustain the injury, inflame and become sloughy; and in consequence of such alteration in them, the pericranium separates from the outside of that part of the bone which received the blow, and the dura mater from the inside; the latter of which membranes, soon after such inflammation, becomes sloughy also, and furnishes matter, which matter being collected between the said membrane and the cranium, and having no natural outlet whereby to escape or be discharged, brings on a train of very terrible symptoms, and is a very frequent cause of destruction. The effect of this kind of violence is frequently confined to the vessels connecting the dura mater to the cranium, in which case the matter is external to the said membrane; but sometimes the matter, formed in consequence of such violence, is found on the surface of the brain, or between the pia and dura mater, as well as on the surface of the latter, or perhaps in all these three situations at the same time."[1] The symptoms are those of inflammation of the membrane. There is one observation, however, connected with them, worthy of particular notice in a juridical point of view, and that is, that no violent symptoms of any kind may appear for days, or even weeks, after the date of the accident. "The time when inflammation follows the violence," says Sir Astley Cooper, "is generally about a week, rarely sooner. Frequently it does not come on for a fortnight or three weeks after the injury; and even more time must elapse before the patient is quite safe, or ought to deviate from a strict and temperate regimen. In confirmation of this remark, a case is mentioned where the neglect to keep the bowels regular brought on a fatal attack of inflammation of the brain, as late as four months after the receipt of a blow on the head."[2] If such a case were to become the subject of a criminal trial, it would form a nice question to determine how far the accused was responsible for

[1] Cooper's Surgical Dictionary.
[2] Ibid. Lectures, &c. i. 339.

the effects of the injury, or how far he was exonerated by culpable neglect on the part of the sufferer or his medical advisers.

To distinguish the cases described from those which are not the effects of violence, it may be remarked, that idiopathic inflammation of the dura mater is a very rare disease compared with the inflammations of the other membranes; only one case is recorded by Dr. Abercrombie,[1] and several others referred to; it is most generally found in connection with caries of the cranium or bones of the ear. Besides, the blows which produce such an effect will, I conceive, generally be of such a character as to produce ecchymosis of the scalp or effusion of blood betwixt it and the cranium, in which case its connection with external violence will be readily determined.

A slow and chronic action is sometimes set up by injuries of this kind, which produces death at a period much more remote. Thus, Mr. Howship relates a case, where, from a slight blow with the flat side of a ruler, a boy became subject to epileptic fits, and died after the lapse of *six years;* induration of the middle lobe of the cerebrum was found on dissection: and in another case, a "slight tap" on the head at the age of fifteen, produced death *forty years* afterwards. Pain was frequently present during life, and latterly somnolency and impaired vision. On dissection, the bone at the place injured was found thin and transparent, and the portion of brain under it indurated and scirrhous.[2]

Another effect of blows on the head is concussion; this may result from force applied directly to the head, or from falls on distant parts, as on the nates, or from falls on the head itself, in which case it will generally be complicated with fracture or effusion. Death may result instantaneously, as happened in the case of the French criminal, who ran head foremost against the wall of his dungeon, and instantly fell dead;[3] but between this effect and the

[1] On Diseases of the Brain and Spinal Cord, p. 28.

[2] Practical Observations in Surgery, &c. London 1816, pp. 119-123.

[3] Smith's Principles of Forensic Medicine, 1825, p. 250.

slight confusion or stunning produced by a trifling blow, there are many degrees. If the weight of the blow be very great, laceration of the substance of the brain may be produced; but in general, no morbid appearances are found in the brain, on dissection, to indicate the cause of death. In most cases, however, connected with medico-legal investigation, this circumstance alone, together with the marks of contusion found on the scalp, or the general evidence of a blow having been struck, will sufficiently point out the cause of death.

Fracture of the skull is an effect chiefly of heavy blows, or of falls. Blows, and falls "from a great height on the top of the head,"[1] are the most frequent causes of fractures at the base of the skull. Thus, in a trial before the Justiciary Court of Scotland in 1812, it was proved that the murder was committed by repeated blows on the top of the head, yet on dissection it appeared that death followed from extravasation of blood from four fractures, all of which were at the base of the skull."[2] Such cases are dangerous, either from the concussion, or the inflammation which may follow the blow, or from the compression which may be produced by the depression of a portion of bone, or the effusion of blood from rupture of some vessel.

All cases of compression from fractures and depression of bone, must certainly be referred to violence, even although there should exist no ecchymosis or puffiness of the scalp to indicate a blow.

Compression from the effusion of blood may be known to have been caused by violence, as has been suggested by Mr. Shaw, if the blood be found between the skull and dura mater. In spontaneous apoplexy, hæmorrhage has certainly never been known to take place in this situation. The evidence that it is an effect of external injury, will of course be strengthened by marks of violence being found at the same time upon

[1] Sir A. Cooper's Lectures, &c. i. 289.

[2] Beck, 626, from Dunlop's MS. Lectures.

the scalp. Even if the hæmorrhage should have occurred elsewhere, at the base of the brain, into the ventricles, or into the substance of the brain itself, it has almost certainly been an effect of violence, if accompanied with fractures of the cranium, or puffiness of the scalp. In such cases it will be proper, however, to ascertain whether or not the brain was previously in a healthy condition, whether there existed congestion or softening of the substance of the brain, or disease of its arteries, as these circumstances may predispose strongly to the rupture of a vessel and the effusion of blood, either from a slight blow, a mere struggle, or even the excitement of a quarrel. In such cases, unless there was strong evidence of malice prepense, the punishment of the accused would probably be greatly restricted. Thus, in a case related by Mr. Shaw, where an industrious man had struck his wife repeatedly on the head while she was in a state of intoxication, and she was soon afterwards found dead in her bed, there were found, on examination, several bruises of the scalp, but no injury of the bone, or effusion between it and the dura mater; but on opening the membranes, there was seen a serous effusion under the arachnoid, and points of extravasated blood on the surface, on tracing which towards the base, they appeared to be streams of blood which had flowed from a vessel ruptured in the base of the brain, and the base was covered with coagulated blood, in which all the roots of the nerves were involved. The blood had penetrated into the ventricle by perforating its floor. On tracing the arteries of the brain, the blood was ascertained to have come from the anterior artery of the cerebrum of the left side, which was half torn across. Sir Charles Bell stated that there was a condition of the vessels which predisposed them to rupture from an external shock or injury, and that drunkenness might be supposed to be the artificial state of excitement which most resembles this state of the vessels; he conceived that in this case a shock would rupture the vessel, and was of opinion that intoxication and the struggle were likely to produce such a degree of ac-

tivity of the circulation in the head, that a less violent blow might produce rupture, than what in other circumstances might have proved fatal. The man was acquitted.[1]

Again, if there was no evidence of predisposition to apoplexy, either from disease of the brain itself or its arteries, or from hypertrophy of the heart, there would be some ground for suspicion, if not of probability, that death, from effusion of blood into the cavities or substance of the brain, was caused by violence, even although there were no marks of that violence either in ecchymosis and tumour of the scalp, or fracture of the cranium.

Blows and contusions of the *face* may come under the consideration of the medical jurist, either in consequence of the disfiguration produced by them, or as causes of death from their extension to vital parts. They may also produce serious inconvenience from their effects upon the organs of sensation. Thus a case is mentioned by Dr. Monteath, where a person received a blow on one of the eyes, in attempting to separate two persons who were fighting. The eye-ball was burst, and vision entirely destroyed.[2] "Blows on the nose," says Dunlop, "which have the effect of fracturing the bone, produce frequently not only personal deformity, but, ultimately, loss of the power of smelling, and sometimes an insufferable stench, proceeding from the diseased state of the bone inside of the nose, called by the French surgeons *punais*, which has the effect of rendering its unfortunate victim quite unbearable in society. I had a case of this kind under my charge while in the army. The patient was a lad of the name of Tobin, who, though I tried every mode of recovering him, was ultimately obliged to be discharged from the regiment, because the stench he created was so intolerable that it was found impossible for any one to sleep in the same barrack-room with him. He had received an injury which had beat in the bones of his nose, pre-

[1] Manual of Anatomy, from Beck.
[2] Med. Chir. Review, ii. 640. Ibid.

vious to entering the regiment; but, so far as I am aware, the disease broke out afterwards."[1]

"Mortal wounds," says Dr. Smith, "have been inflicted, through the face, on the contents of the cranium." "A man was killed by a blow on the nose, the consequence of which was that the lower jaw could not be opened, and, in the opinion of the surgeon, he died from inanition, sixteen days after the accident. He was also unable to perform the usual natural evacuations. There was no fracture about the head, and the external wound had nearly healed up."[2] So in the case of James Macara, 21st January 1811; the accused struck the deceased a fatal blow between the eyes, with a pair of heavy furnace tongs, which occasioned death.[3]

Blows and contusions of the *neck* may cause death from various circumstances, such as the rupture of important vessels, and the extravasation of blood in large quantities, &c.; such cases must be judged of by the appearances presented on dissection. The trachea has been ruptured by a kick, and by the neck being driven with violence against a post. Both cases proved fatal.[4]

If the blows are severe they may cause death by fracture and displacement of the cervical vertebræ, by concussion of the spinal cord, or by effusion of blood within the canal. Examples of concussion have already been referred to.[5] Death from this cause may result instantaneously, or may follow more slowly from subsequent inflammation.

Injuries of the spine are more dangerous above the fourth, than below the third cervical vertebræ; in the one case instant death may result from the sudden stoppage of the respiration, if the bones press against the upper part of the spinal cord; in the other, the sufferer may linger for some time, with palsy of the inferior part of the body. This rule, however, is not constant. Thus in a case mentioned by Dr. Spencer, of a man who fell backward in attempting to scale a

[1] Dunlop, Op. Cit. 630. [2] Op. Cit. 254.
[3] Hume, i. 253. Alison, Op. Cit. 7. [4] Beck, 632. [5] Pp. 9, 10.

fence, the *dentata* was luxated anteriorly on the third cervical vertebra. He lost all sensation below the head, but preserved his speech and mind to the last. He died in forty-eight hours.[1]

Spontaneous luxations of the head from the atlas, and fractures of the odontoid process of the dentata, from previous destruction of the ligaments and caries of the bones, are not uncommon. Death from this cause has been known to occur in bed; thus, "a boy who was under treatment in the Richmond Hospital, (Dublin,) for some disease of the leg, was one morning, during the visit, sitting up in his bed, talking with those around him, when his head suddenly fell forward on the breast, and he dropped dead."[2] A similar case is mentioned by Sir Astley Cooper, in which death occurred instantly. Another case is related by him, which occurred to Mr Cline, in which a transverse fracture of the atlas was occasioned by a fall, and the processus dentatus had in consequence lost its natural support. Death followed in twelve months.[3] In a case mentioned by J. L. Petit, instant death was caused by lifting a child up by the head. Boyer conceives that in this case, the lateral and accessory ligaments were ruptured, and the dentata displaced from under the transverse ligament.[4] Lateral displacement of the dentata may also take place spontaneously, to a great extent, from disease of the ligaments, causing death by compression. Again, by violence, the processus dentatus may be fractured at its base, and forced back upon the spinal marrow, the ligaments remaining entire. A case of this kind is recorded by Sir A. Cooper.[5]

An obscure but interesting case, presenting several intricate questions respecting contusions of the neck, occurred in the trial of Robert Reid, 29th June 1835. His wife was found dead in a sitting posture, at the side of her bed, with the head erect, the one arm resting by the hand on the floor, and the

[1] Beck, from the Boston Med. and Surg. Journal.
[2] Beatty, Cyc. of Pract. Med. iv. 554.
[3] On Dislocations, 547—549. [4] Cooper, Surg. Dict. 392. [5] Ibid.

other uplifted, with the elbow resting on the edge of the bed, but the hand and head unsupported. Lividity was afterwards found on the back and sides of the neck. A considerable quantity of extravasated blood was found under the skin, which seemed to have proceeded from rupture of the jugular vein; but whether it was ruptured (a very uncommon occurrence) from a blow previous to death, or from the operations of the dissector, does not appear to have been determined by the medical witnesses. The processus dentatus was fractured, but the ligaments seem to have been entire, as it was retained in its place till after the removal of the vertebræ. The bones, however, were not produced to shew that no caries of the parts existed. The medical evidence on the part of the Crown, conceived that the fracture had been produced by a blow inflicted during life; this being attested by the presence of ecchymosis, and of coagulated blood between the skin and muscles,—that death resulted from concussion, and that the body had been placed in the position in which it was found while rigidity was coming on. The medical evidence, on the other hand, for the pannel, denied that there was sufficient proof of ecchymosis, or of the blood being coagulated, it being described as seen "flowing" from the part; and gave it as their opinion, that there was every reason to believe, from the manner in which the dissection was conducted, that the blood was effused from a laceration of the jugular vein, made with the scalpel; that, there being proofs of previous disease of the brain or spinal cord, the deceased probably died in a fit, the position of the body being caused by convulsions, and that the fracture of the processus dentatus was either spontaneous, or the result of the subsequent handling and disinterment of the body. In these circumstances the public prosecutor abandoned the prosecution.[1]

There is a case related by Mr. Howship, where a jerk with

[1] Report of the Trial of Robert Reid, for Murder: Black, Edin. 1835. Remarks on the Trial of Robert Reid, &c. by John Fletcher, M.D. 1835.

a cord was inflicted upon the neck while swinging. Nothing but a slight ecchymosis was produced at the time; but in a few months the patient died, and on dissection it was found that some of the vessels on the posterior part of the vertebræ had been ruptured, and effusion had taken place into the spinal canal.[1]

Ecchymosis of the neck may be produced by pressure in cases of death from hanging or strangulation; but these subjects scarcely come within the limits of this paper.

Blows and contusions of the *thorax* will produce various effects according to the degree of violence and the nature of the instrument with which they are inflicted. Fractures of the ribs are common results of external force. These may prove dangerous from the inflammation of the pleuræ or lungs to which they may give rise, more particularly if the broken ends are forced into the substance of the lungs. Cases of rupture of the viscera of the thorax and of fracture of the bones, without any external ecchymosis have been given in a former part of this paper.

We have already spoken of those cases of blows on the *epigastrium* which produce sudden death, and have detailed cases of rupture of the viscera of the *abdomen* from heavy weights, without injury of the superficial parts. Ruptures of this kind are not always the effect of external violence, but may be produced by the over-distention of the stomach with food, or by the accumulation of gases from depraved digestion. A case of the latter kind is noticed by Professor Barzalotti,[2] an illustration of the former is afforded by Lallemand. "A woman convalescent from a long attack of dyspepsia, being desirous to make amends for her long privations as to diet, ate one day to satiety. Ere long she was seized with a sense of weight in the stomach, nausea, and fruitless efforts to vomit. Then all at once she uttered a

[1] Op. Cit.

[2] Christison on Poisons, 1832, 102, from Medicina Legale, ii. 22.

piercing shriek, and exclaimed that she felt her stomach tearing open; afterwards she ceased to make efforts to vomit, soon became insensible, and in the course of the night she expired. In the fore part of the stomach there was a laceration five inches long; and a great deal of half-digested food had escaped into the cavity of the abdomen. The coats of the stomach were healthy, but the pylorus, or opening into the intestines, was indurated, which had been the cause of her dyspepsia.[1] A similar case followed the drinking of a little gin and water. In another case, more likely perhaps than these to be attributed to violence, "a healthy coal-heaver in London, while attempting to raise a heavy weight, suddenly cried out, clapped his hand over his stomach, drew two deep sighs and died on the spot. On dissection a lacerated hole was found in the stomach, big enough to admit the thumb, and the stomach did not contain any food."[2]

Dr. Christison also refers to cases of death from rupture of the duodenum, of the biliary ducts, and of the parietes of a Fallopian conception, the first followed a fit of anger, the second an attack of jaundice, and the latter seemed to occur spontaneously.[3] Such cases require to be in the recollection of the medical jurist, as they might be mistaken for the effects of external violence, or the operation of irritant poisons. They are, in general, easily determined by the collateral circumstances, or by the co-existence of an inflamed, ulcerated, or softened state of the mucous membrane of the intestines.

Ruptures of the other viscera of the abdomen have also occurred from violence. In the case of Bartholomew Quain, 1790, rupture of the spleen was produced by kicks.[4] "Several cases of rupture of the intestines from violence are related; Dublin Hospital Reports, iv. 349; by Mr. Spear, of

[1] Christison on Poisons; Praktisches Hanbuch fur Physiker, iii. 292.

[2] Ibid. from the London Medical Repository, xvii. 108.

[3] Ibid. 103.

[4] Paris and Fonblanque. Medical Jurisprudence, 1823, ii. 123.

the cæcum from a fall in wrestling. Western Medical and Physical Journal, i. 550; by Dr. Drake, of the jejunum, from the kick of a horse. Medico-Chirurgical Review, xxiv. 142. Two cases of rupture of the jejunum, one from a kick and the other from a cart passing over the abdomen, quoted from Bransby Cooper. All these proved fatal."[1] In another case, the right kidney was torn in two transversely by a kick from a horse. The person survived but twenty minutes.[2]

The case may be modified by the co-existence or subsequent appearance of another and unlooked-for disease. Thus in the case of Lydia Alder, who was tried in 1744 for the murder of her husband, whom she kicked on the groin, in consequence of which, having at the time an inguinal rupture, mortification came on and he died.[3] So in the case of Alexander Mackenzie, March 1827, it appeared that he had thrown the deceased on the ground, and trampled on his groin, which brought on lock-jaw, of which he died some days afterwards.[4] A large abscess of the liver, or aneurism of the abdominal aorta, might predispose to death in a similar way, even from blows which were comparatively slight, and perhaps innocent.

Contused wounds of the *extremities* may prove fatal in consequence of dislocation or fracture, or the subsequent occurrence of tetanus, erysipelas, or mortification. Death sometimes happens in such cases after a considerable lapse of time, which however forms no valid ground of defence if the injury have grown progressively worse. Thus in the case of John Young, 1630, the pannel was indicted for murder, by striking "with a whinger on the shackle bone" in June, of which the sufferer died in October.[5] The case may be mo-

[1] Beck. Op. Cit. 638, note.
[2] Smith, Op. Cit. 265.
[3] Paris, &c. ii. 122.
[4] Alison, 95, from Syme's Justiciary Reports, 158.
[5] Ibid. 151, from Burnet, 552.

dified by constitutional pre-disposition. Thus in the case of W. Macewan, Perth, 1830, the pannel was indicted for the culpable homicide of a boy, in a manufactory of which he was the overseer, by striking him on the shoulder, which dislocated the arm. On proof, it appeared that the boy's arm had been worked upon, two days after the blow, by an ignorant bone-setter, whose operations did more harm than good, and in consequence of the inflammation thus occasioned, acting upon a sickly and scrofulous habit of body, a white swelling ensued, which proved fatal. On this evidence the pannel was acquitted.[1] As seems to have been partly the case in this instance, the injury may be modified, not only by the predisposition of the sufferer, but also by the neglect or bad treatment of the medical attendant. If the injury has been the result of neglect on the part of the inflicter, it may form the basis of a civil trial, as in cases of insufficiency in coaches, passage-boats, &c. So the ignorance or negligence of the medical attendant may be a valid plea for damages. There was a case of this kind recorded some time ago in the newspapers, where the plaintiff, a gentleman who had been upset in a coach, recovered L.800 damages against the defendant, a surgeon, for unskilful treatment of a dislocation of the shoulder-joint, by which the plaintiff was partially deprived of the use of his right arm.[2]

Death may result apparently from blows on the extremities, without any serious displacement or rupture of parts. In the two following cases, there appears to be some want of facts as to the immediate cause of death, otherwise they must be considered as somewhat extraordinary. "In one instance which occurred at the Lincoln assizes in 1812, the prisoner was charged with the murder of a boy by whipping him. The deceased died within two days; many bruises and discolorations were discovered about the loins and thighs, and the professional opinion was, that he had died from the ab-

[1] Syme's Justiciary Cases, 158.

[2] Beck, 664, note.

sorption of extravasated and mortified blood into the system"[1] The other and the most extraordinary case was that of Brain for the murder of Watts, in which it appears that the deceased died instantly from a blow on the *calf of his leg*.[2]

The danger of blows and contusions of every kind may be modified by many collateral circumstances; such for instance are the age, sex, and constitution of the sufferer, the existence of previous disease, or the subsequent neglect of the surgeon or his patient. The medico-legal questions relating to any wound will be rendered more intricate by these circumstances, and the determination of them may peculiarly modify or restrict the punishment of the accused. Such cases have been occasionally alluded to in the course of these remarks, but as they affect equally the questions relating to wounds of every kind, and the full consideration of them would increase this Essay to an unusual bulk, the further notice of them is omitted.

[1] Smith, 267.

[2] Paris and Fonblanque, ii. 122. In the two cases alluded to above, there was probably some great defect in the post-mortem examinations. An instructive case, in some respects similar to the first of these, is related by Dr. Wildberg of Rostock, where a girl died suddenly while her father was in the act of chastising her for a theft. On examination of the body, the marks of stripes were found on the arms, shoulders, and back, and under them considerable extravasations of blood. Not considering these, however, adequate to account for death, Wildberg extended his examination, and found the stomach very much inflamed and lined with arsenic, which it afterwards appeared she had swallowed in fear of her father's anger. Christison on Poisons, 54.